Moving towards Zero-Waste;

Integrating composting into your home, business, institution, & local municipal solid waste plans and programs.

Every community has a choice, we can have this….

or we can have this

and this


Vermont Compost
Compost Plus
Vermont Compost
Perennial Blend
Vermont Compost
Fort Vee
Vermont Compost
Fort Light
Vermont Compost
Manure Compost

and this

Why bother?

because we are care about where we live

composting is an alternative to landfilling or waste incineration where we live

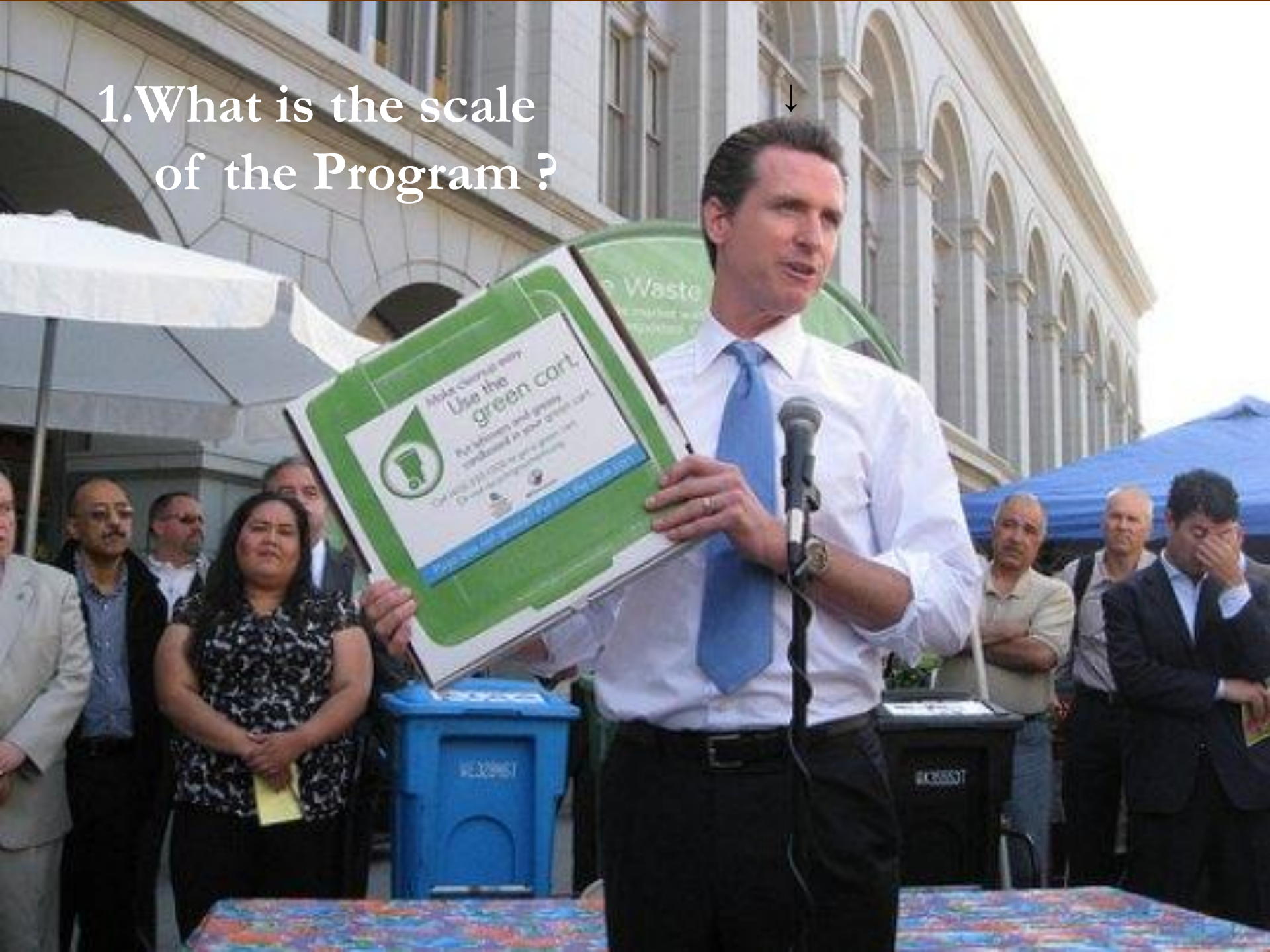
Compost:
natural process with which we interfere
manipulate by creating an optimum organic mass
at optimum carbon nitrogen ratio, surface area,
moisture; oxygen; (the bugs Los Vegas) to compress time;
create something useful and intrinsically understandable
once the public see it –they get it- then they want it

- Composting can be everywhere at every scale and level
- it is driven by personal decision, attitudes and actions
- it is hands on (and hands in)

First questions that need an answer

What will be the scale of the program?

- How many will it serve? one household, one town?
- What organics are out there ?
- What is the potential recoverable fraction of the waste stream ?
- How much waste does your community produce?
- What are you trying to capture?
- From what source?
- What is the existing infrastructure-what are the infrastructure needs- do they match?


1.What is the scale of the Program ?
Use the green cart


Are you trying to reach
every willing homeowner
with a “front stoop” bin?


Or a green cart at every home?
18" BETWEEN CARTS
18" BETWEEN CARTS
Wheels Against Curb
Grey Cart Garbage Only
Blue Cart Recyclables Only
Green Cart Yard/Food Waste Only

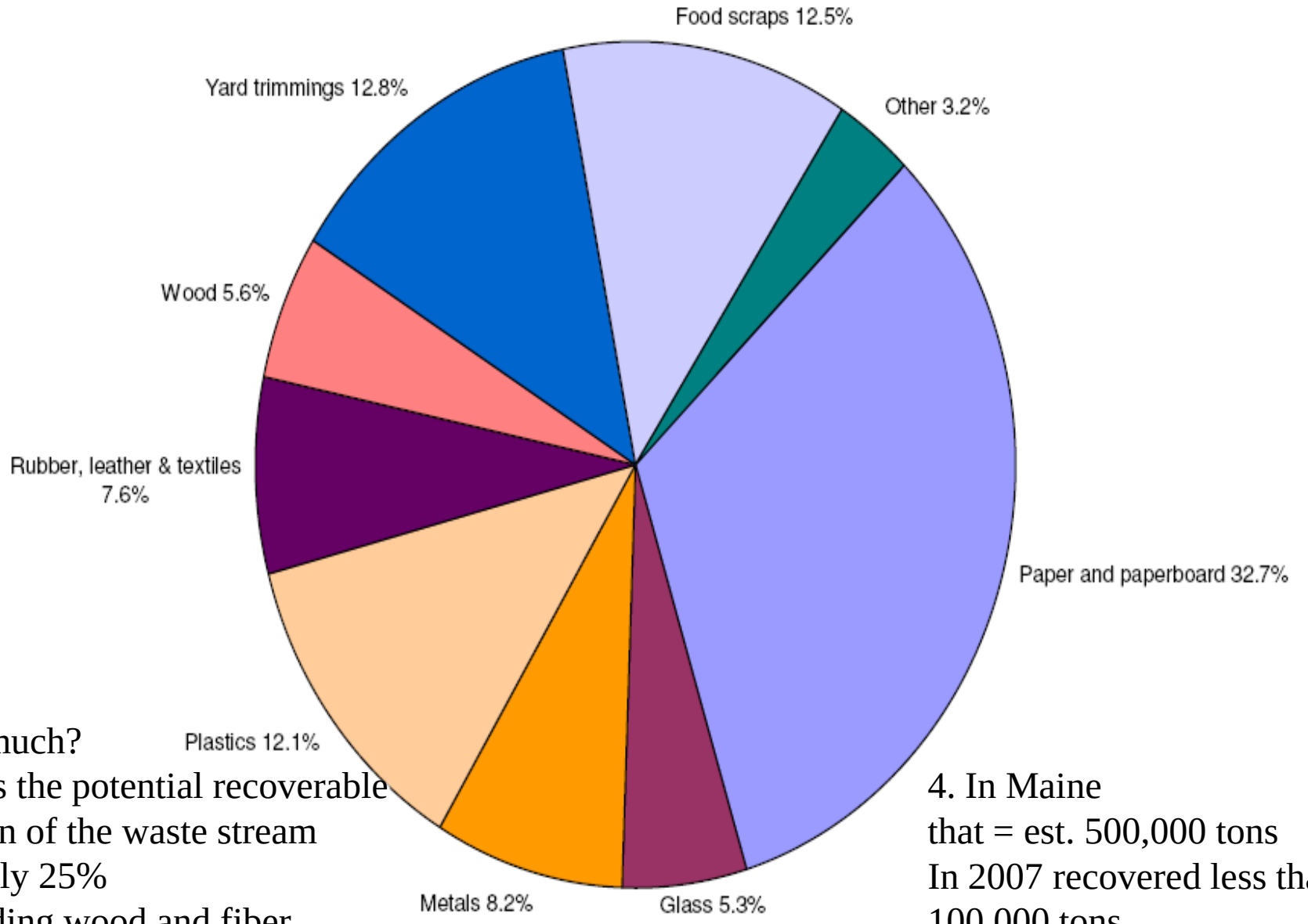

2. Is it at the Neighborhood
or community level?


With people power
transport needs

While in Northern New England,
Composting
may look more like this…

What happens when a city of 8,363,710 decides it's the right thing to do ?

Figure ES-3: Materials Generated in MSW, 2007
(254 Million tons before recycling) (EPA)

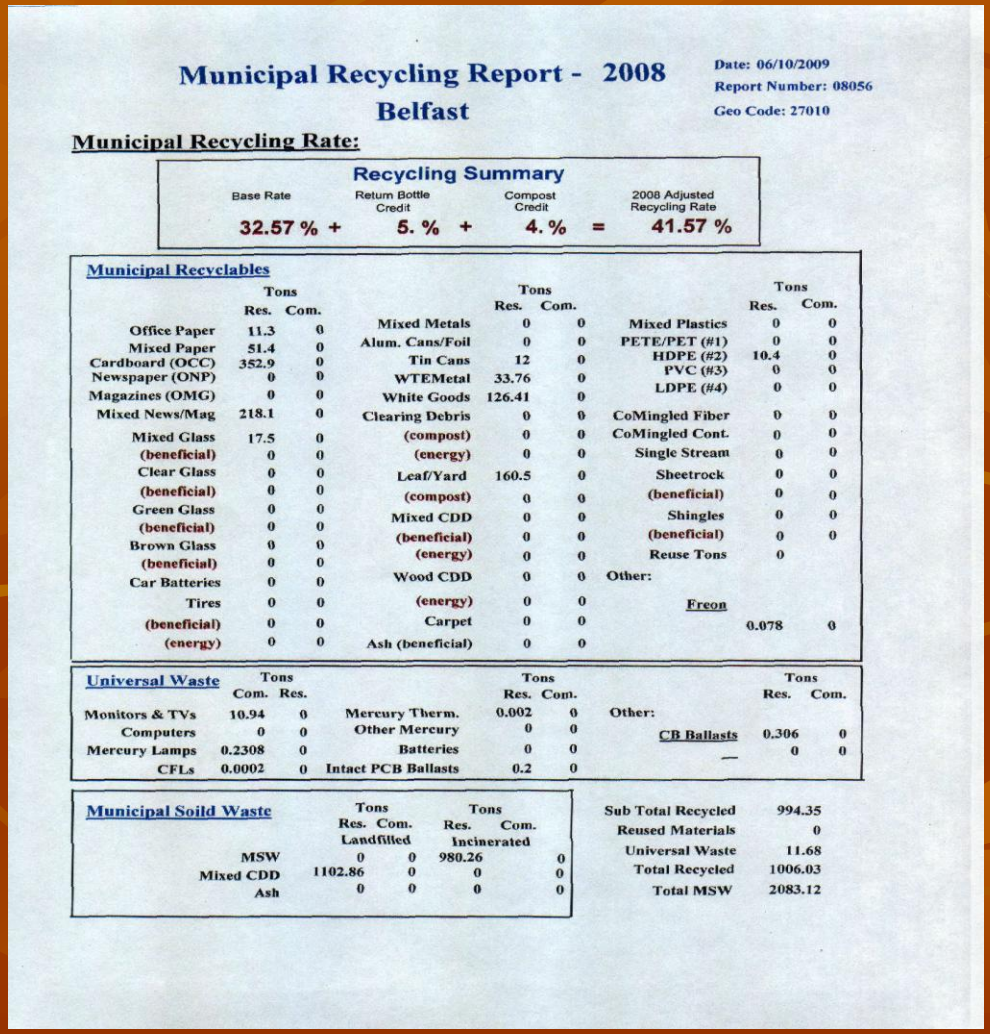


3. How much?
what is the potential recoverable fraction of the waste stream
Roughly 25%
Excluding wood and fiber

4. In Maine
that = est. 500,000 tons
In 2007 recovered less than 100,000 tons

5. How much waste does the community produce?

- In Maine, we have annual solid waste program reports, similar data collected in other states



Municipal Recycling Report - 2008

Date: 06/10/2009
Report Number: 08056
Geo Code: 27010

Belfast

Municipal Recycling Rate:

Recycling Summary

Base Rate		Return Bottle Credit		Compost Credit		2008 Adjusted Recycling Rate
32.57 %	+	5. %	+	4. %	=	41.57 %

Municipal Recyclables

	Tons Res.	Com.		Tons Res.	Com.		Tons Res.	Com.
Office Paper	11.3	0	Mixed Metals	0	0	Mixed Plastics	0	0
Mixed Paper	51.4	0	Alum. Cans/Foil	0	0	PETE/PET (#1)	0	0
Cardboard (OCC)	352.9	0	Tin Cans	12	0	HDPE (#2)	10.4	0
Newspaper (ONP)	0	0	WTEMetal	33.76	0	PVC (#3)	0	0
Magazines (OMG)	0	0	White Goods	126.41	0	LDPE (#4)	0	0
Mixed News/Mag	218.1	0	Clearing Debris	0	0	CoMingled Fiber	0	0
Mixed Glass	17.5	0	(compost)	0	0	CoMingled Cont.	0	0
(beneficial)	0	0	(energy)	0	0	Single Stream	0	0
Clear Glass	0	0	Leaf/Yard	160.5	0	Sheetrock	0	0
(beneficial)	0	0	(compost)	0	0	(beneficial)	0	0
Green Glass	0	0	Mixed CDD	0	0	Shingles	0	0
(beneficial)	0	0	(beneficial)	0	0	(beneficial)	0	0
Brown Glass	0	0	(energy)	0	0	Reuse Tons	0	
(beneficial)	0	0	Wood CDD	0	0	Other:		
Car Batteries	0	0	(energy)	0	0	Freon		
Tires	0	0	Carpet	0	0		0.078	0
(beneficial)	0	0	Ash (beneficial)	0	0			
(energy)	0	0						

Universal Waste

	Tons Com.	Res.		Tons Res.	Com.		Tons Res.	Com.
Monitors & TVs	10.94	0	Mercury Therm.	0.002	0	Other:		
Computers	0	0	Other Mercury	0	0	CB Ballasts	0.306	0
Mercury Lamps	0.2308	0	Batteries	0	0	—	0	0
CFLs	0.0002	0	Intact PCB Ballasts	0.2	0			

Municipal Soild Waste

	Tons Res.	Com. Landfilled	Res.	Com. Incinerated
MSW	0	0	980.26	0
Mixed CDD	1102.86	0	0	0
Ash	0	0	0	0

Sub Total Recycled	994.35
Reused Materials	0
Universal Waste	11.68
Total Recycled	1006.03
Total MSW	2083.12

Will you need 50,000 of these…

And the corresponding public relations
and education campaign to get them used

Or 50,000 of these

And 1 of these


In Maine, The average person produces approx. 150-200lbs of food waste per year
80% of restaurant waste is recoverable food wastes
Cafeterias, supermarkets, commercial and industrial food producers and processors have similar percentages

6. What are you try to capture?

←Leaf and yard

Food Wastes →


Homogeneous materials
processes & operations
simple and straightforward


Other materials …
Less so….

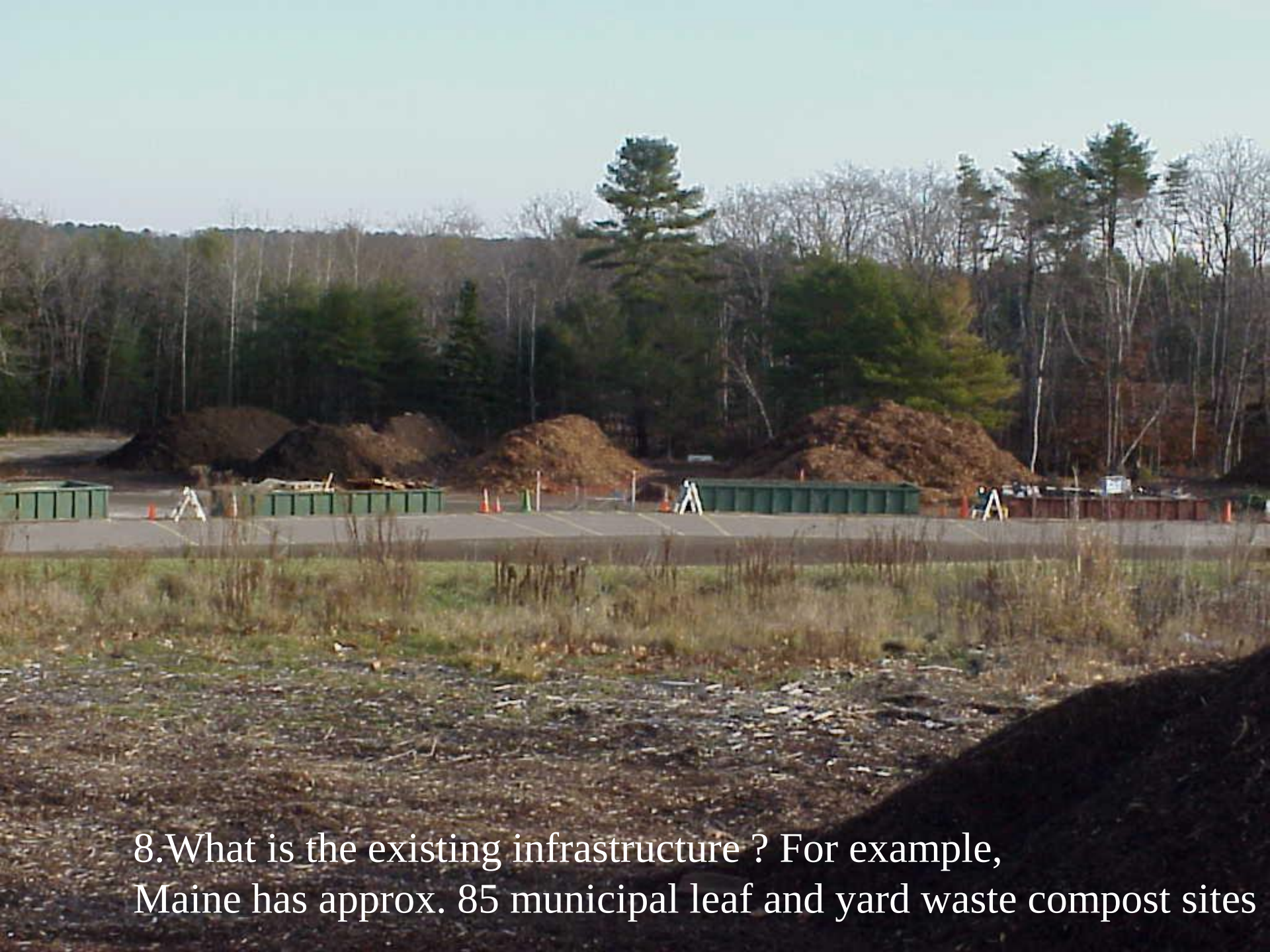
7. From what sources?

← residents

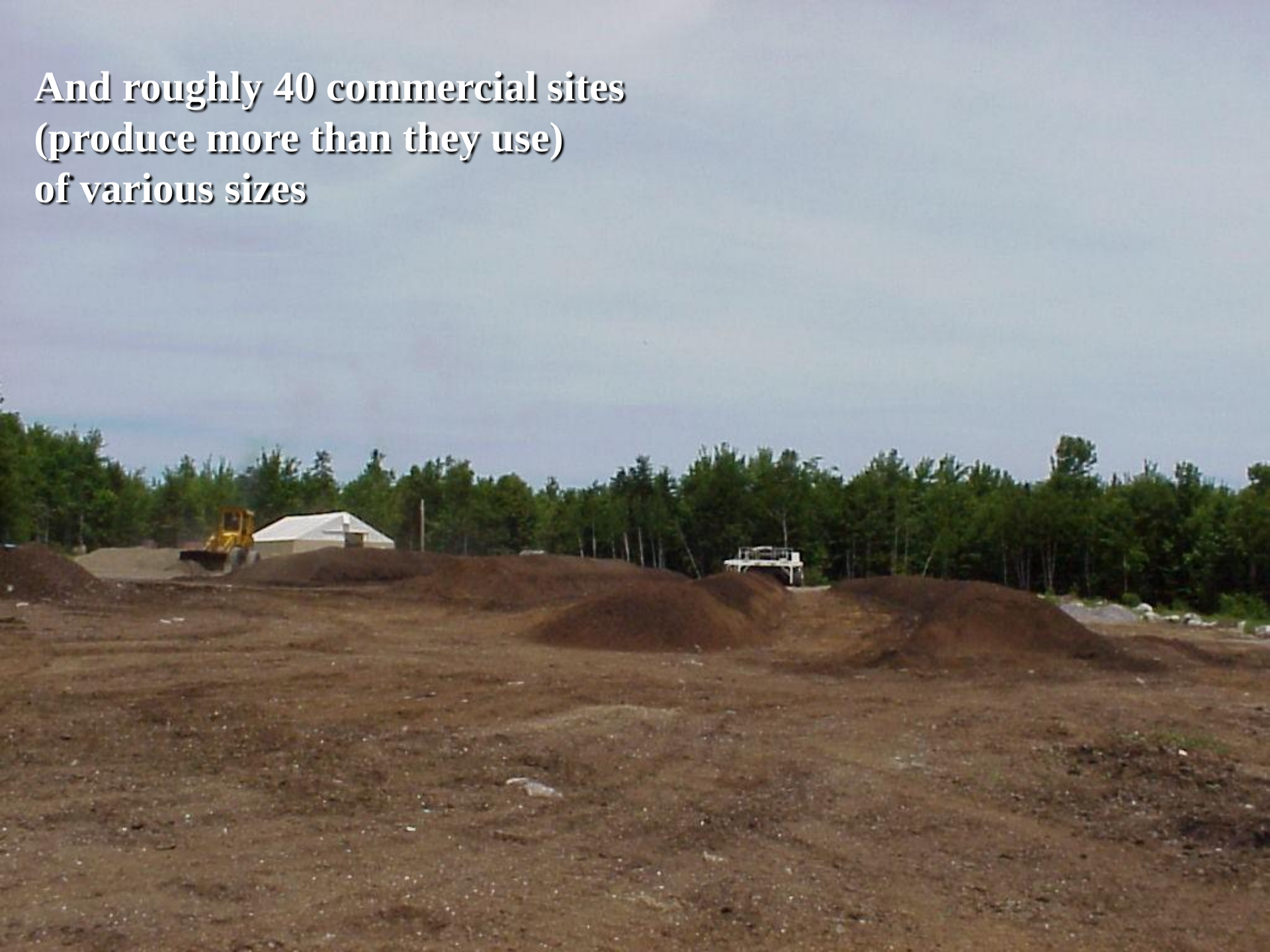
Commercial and industrial sources

↓

← Institutions (cafeteria at (UMO)



8.What is the existing infrastructure ? For example,
Maine has approx. 85 municipal leaf and yard waste compost sites


And roughly 40 commercial sites
(produce more than they use)
of various sizes


Large scale licensed to accept all organics
HAWK RIDGE COMPOST FACILITY


Intervale VT Site

Resource Recovery Planning- identifying and anticipating needs and building relationships between

The people who

- produce this “resource”
- want to collect and transport it,
- want to compost and sell it
- have resource management goals &
- regulate the sites and activities (public sector)

Using haulers as an example

- Haulers need collection efficiency

- Long term access to compost sites

Will this meet your transport needs

Or this

What to plan for

- Infrastructure- public sector or private sector proposals
- transportation
- lead up PE/PR
- Budget
- Community waste audit
- Managing the resource for the long term, because…
- Predictability- everyone needs it!
- Managing perceptions!

For example: if people's perceptions of organic recovery is this

Emphasizing proper management to change their view

Will this change their perception

Courtesy of John Majercak @Center for Ecological Technology

Courtesy of John Majercak @Center for Ecological Technology

What to encourage

- Community level waste to resource management plan
- Infrastructure/Operations development
- ordinance adoption- offers incentives/disincentives to encourage organics recovery

What does the 2009 Maine State Waste Management Plan say about composting?

- Encourage!
- Hierarchy
- Symposium in 2004
- 3 attempted Pilot Projects- (Ron's site #1)
- New rules potentially encourage on farm sites
- Increase potential large scale sites

Run up to 50% recycling goal

- *Objective: Encourage communities to ban the disposal of leaf and yard waste.*
- Municipalities would be encouraged to establish leaf and yard waste compost programs to divert up to 13% of their waste stream from disposal and provide quality compost for municipal projects and community use.
- The goal is to build up the composting infrastructure (sites, trained people and equipment) in numbers of locations and the capacity of those locations around the state.

Getting beyond 50% recycling

- *Objective: Encourage the separation and collection of all organics*
- The development of a system of public and private composting facilities within all major service center areas to support full-scale organics composting.
- Leaf and yard materials would be banned from disposal by 2020.
- Communities would be encouraged to include organics collection provisions to homes and commercial establishments in their contracts.

Conducting a Waste Audit available at no charge from DEP/SPO

1. Facility background
2. Current system, collection storage hauling
3. Facility walkthrough
4. Current waste reduction program
5. Waste sort
6. Potential reduction options
7. Economic and operational feasibility

WORKSHEET

1 Facility Background Information

Use this worksheet to assemble background information on your company's layout and organization.

Data collected for this worksheet will be useful in designing and implementing your waste reduction program. Company records will provide much of the information requested. Interviewing building and department contacts may also be helpful.

If your company occupies several different buildings, you may want to record the requested information separately for each building, copying the blank worksheet as needed.

WORKSHEET

1 Facility Background Information

Building Name/Number:
Building Owner or Management Company:
Name of Contact:
Telephone Number:

A Physical Layout and Organization

Building Location		
Number of Employees	Size (Area):	Number of Floors:
Is the Facility Equipped with ☐ Freight Elevators ☐ Loading Dock		
List any Other Companies Leasing Space in the Building:		

Company	Name of Contact	Telephone Number

B Building Departments and Functions

Department:
Name of Contact:
Telephone:
Location:
Major Functions:
Department:
Name of Contact:
Telephone:
Location:
Major Functions:

WORKSHEET

3 Facility Walk-Through

Use this worksheet to identify and record the different solid waste-generating activities and equipment in your facility, the types of waste produced, onsite storage facilities, and any current waste reduction efforts.

The information needed to complete this worksheet can be obtained by conducting a walk-through of each department in your facility. The walk-through entails carefully observing all waste-generating activities and equipment, examining waste containers, and interviewing supervisors and employees.

Be sure to pay close attention to areas and operations that tend to be the largest generators of waste, such as shipping and receiving departments, copying areas, cafeterias, assembly lines, and offices. Remember to include a review of the grounds maintenance operations. While conducting the walk-through, watch closely for activities and equipment that may generate waste unnecessarily.

Before the walk-through begins, contact department managers to inform them of the visit and the possibility of short interviews with department staff. (More involved interviews should be scheduled separately.) You may also want to interview custodial workers and operations staff.

If possible, schedule the walk-through just before trash pickups to allow a sufficient amount of waste to accumulate. Avoid scheduling it on or around holidays, company parties, or other special events that would produce wastes not representative of a normal work day.

During the walk-through, ask questions about variations in daily waste generation. For example, periodic deliveries may result in more discards on the delivery day. In addition, ask about changes within the department, such as new equipment or procedures, that could change the types or amounts of waste generated.

Larger companies may want to record this information by department, copying the worksheet as needed.

WORKSHEET

3 Facility Walk-Through

Department:	
Manager:	
Telephone Number:	

A Waste Components

Waste-Producing Activity or Equipment	**Waste Material Produced**	**Estimated Amount of Waste Produced per Week**	**Current Waste Reduction Activities** (If Any)	**Waste Reduction Equipment**
Receiving Shipments	*Cardboard boxes*	*About 50 boxes*	*Recycling*	*Baler*
	Polystyrene Peanuts	*2 waste containers 5 cubic yards each*	*None*	*None*
Copy Machine	*Office Paper*	*8 reams of paper*	*Recycling*	*Two-sided copy capability*
	Toner Cartridges	*1 cartridge every 2 months*	*None*	*None*

WORKSHEET

5 Waste Sort

Use this worksheet to develop an accurate, detailed profile of the amounts and types of waste generated at your facility.

This worksheet provides step-by-step instructions for sorting, weighing, and recording data on the waste generated by your company.

Two different types of waste samples may be analyzed for the purposes of this worksheet. Smaller companies should collect and sort all the waste generated during the day. Since this may be impractical in larger companies, these facilities can use a representative sample of approximately 50 pounds of waste from each collection container at their company.

Determine the size and location of the area in which you will sort the waste. For smaller companies, it may be easiest to sort the sample in a large indoor room after business hours. If large quantities of waste will be sorted, a large, flat area such as a parking garage or shipping and receiving area is preferable. It is advisable to sort in a covered area to provide cover from adverse weather. Health and safety issues should be considered as well. All members of the waste reduction team should wear protective clothing, for example, and precautions should be taken to ensure that the waste does not come in contact with food or drink.

You will need several containers for holding the sorted wastes and a scale for weighing the samples. The size of the containers depends on the amount of waste to be sorted. Office wastebaskets might work well for conducting small sorts. For larger companies, 30- to 50-gallon plastic containers, garbage cans, or large corrugated cardboard boxes will be needed. If there are no large scales at your facility, they often can be rented. In addition, you will also need shovels or pushbrooms, protective clothing (such as leather or thick rubber gloves, heavy-duty shoes, safety glasses, and coveralls), a clipboard, and a first aid kit.

A three- or four-person waste reduction team in a small business can probably complete the sorting and weighing in a few hours. Waste sorts at a larger business will take longer, depending on the size of the team and the amount of waste.

If you suspect that the waste sample being sorted is not truly representative of your company's waste generation practices, consult with your trash collection or operations manager for input on the accuracy of the data. Make a note on this worksheet of any results you feel may not be accurate.

WORKSHEET

5 Waste Sort Form

Date of Waste Sort:	**Department (if applicable):**
Source of Sample (if different from department):	
Sample Collected Over: ☐ One Day ☐ Two Days ☐ Other (specify)_____	
Sample Collected: ☐ All Waste at Source ☐ Representative Sample (specify weight)_____	
Members of the Waste Team: _____	

Waste Category		Net Sample Weight	Percent of Total Sample Weight	Amount of Waste Generated Annually
Paper	High Grade			
	Low Grade			
	Newsprint			
	Corrugated Cardboard			
	Magazines/Glossy			
	Other			
	Total Category Sample Weight			
Plastics	PET (1)			
	HDPE (2)			
	PVC (3)			
	LDPE (4)			
	Polypropylene (5)			
	Polystyrene (6)			
	Other (7)			
	Total Category Sample Weight			

The Nova Scotia food waste collection and composting example
One region's program

Valley Waste-Resource Management

- "Region 5" or the "Valley Region"
- Kings and Annapolis Counties
- 83,000 people
- Seven Towns and two County Municipalities
- Small Towns in a Rural Setting

Valley Waste continued…

- Two Transfer Stations
  - Operated by our staff
- Private Sector Contracts
  - Residential Collection
  - Recyclables Processing
  - Contracted Organics Processing
- Public Sector Contract
  - Landfill Disposal

Valley Waste Resource Management

Residential Collection

Residential Collection Basics in Nova Scotia

- Generally four streams
  - Organics
  - Recyclable Paper
  - Recyclable "Containers"
  - Residual Waste
- Generally Bi-Weekly Organics Collection
  - Alternating week collection
    - Garbage alternates with Organics
  - Single Pass Four Stream
  - Seasonal Weekly Organics Collection in some Urban areas
- Mostly Roadside, some Drop-off on Private Roads

Food Waste Collection

Residential Collection: Containers and Vehicles

Containers

- "Green Cart"
  - 65 Gallon (240 liter)
  - 35 Gallon (140 liter)
- 40 liter Container
- Plastic Bag
- Own container

Trucks

- Standard Rear Compactor with tipper
- Two Stream Side Compactor with tipper
- Four-Stream non-compacting truck with side mounted tipper
- General Purpose Trucks

Organics Collection in Halifax

Residential Containers

Small Apartment Storage

Cottage Area Storage

4-Stream Side Loader

Residential Collection Trucks

Side Loading 4-Stream Non-Compacting

Rear Compactor in Halifax

Commercial Collection Containers

- 65 Gallon wheeled cart
- Open Roll-off Containers
- Front-end fork truck "dumpsters"
- Compacting Roll-off Containers
- Plastic Bags
  - Compostable
  - Non-compostable
- Plastic Garbage Cans

Commercial Containers

Roll-Off Container

Commercial Containers: Bags

Commercial Collection Vehicles

- From "Self-Haul" to "Hand Bombers" to Large Commercial
  - Tow-behind trailers (simple, customized)
  - Half-tons
  - Cube Vans
  - Side loading 3 or 4 stream
  - Side Compactors
  - Rear Compactors
  - Front-end fork trucks
  - Roll-off trucks

Commercial Truck

Roll-Off Compactor

Commercial Truck

Restaurant Self-Haul

"Public Waste"
The Tragedy of the Commons

NSCAD Students' Design

Tim Hortons Public Bin

Public Waste: Special Events

Good Earth: Northridge Farms

Curbside Green Cart Material

Northridge Receiving Hall

Primary Composting Hall

Finished Compost

From This...

To This

Valley Waste
2009-10 Costs Per Serviced Unit

Item	Cost	Serviced Units	Cost Per Year
Administration	445,960	38030	11.73
Management Centres	1,378,238	38030	36.24
Residential Collection	**2,236,070**	**38030**	**58.80**
Recycling Processing	442,000	38030	11.62
Organics Processing	**882,600**	**38030**	**23.21**
Residual Disposal & Transportation	1,919,600	38030	50.48
Residual Transportation		38030	0.00
Construction & Demolition Debris Processing	158,350	38030	4.16
Communications and Enforcement	435,038	38030	11.44
Capital Expenditures from Revenue	0	38030	0.00
Fiscal Services Financing	1,015,969	38030	26.71
Information Technology	54,075	38030	1.42
RRFB Approved Programs	102,100	38030	2.68
Transfer to Capital Reserves	0	38030	0.00
Occupational Health and Safety System Support	0	38030	0.00
Sub-Total	9,070,000	38030	**238.50**
Less Revenue	2,701,500	38030	**71.04**
Plus Deficit Funding			
Net Annual Cost	**6,368,500**		**167.46**

Nova Scotia's Waste Management Strategy: Results

Annual Provincial Disposal Rates
1989, 2008, 2015

Year	Kg/capita	lb/capita
1989	743	1635
2008	430	946
2015 (Target)	300	660

Conclusions

1. Technically there is no reason why food waste composting cannot be successful
2. It's good for the environment
3. People will participate and be proud of it
4. It takes time for people to adjust
5. It's about social change
6. It takes a combination of friendly persuasion, compliance promotion, and enforcement

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